

### **REMARKS**

The applicant has carefully considered the official action mailed on February 6, 2008, and the references cited therein. In the official action, claims 1-4 and 6, 8, 11-14, 16, 22-25, 27, 29, and 55-58 were rejected under 35 U.S.C. §103(a) as unpatentable over Van Der Vleuten et al. (U.S. Patent No. 6,535,845) in view of Jensen et al. (U.S. Patent No. 6,421,445), claims 7, 15, and 28 were rejected under 35 U.S.C. §103(a) as unpatentable over Van Der Vleuten et al. in view of Jensen et al. and Best et al. (U.S. Patent No. 5,113,437), claims 9, 17, and 30 were rejected under 35 U.S.C. §103(a) as unpatentable over Van Der Vleuten et al. in view of Jensen et al. and Scheirer et al. (U.S. Patent No. 6,363,175), and claims 10 and 31 were rejected under 35 U.S.C. §103(a) as unpatentable over Van Der Vleuten et al. in view of Jensen et al. and Osawa (U.S. Patent No. 6,167,160). Additionally, claims 18-21, 32-38, 40, and 41 were allowed.

Claims 5, 26, 39, and 42-54 were canceled in a prior response, leaving claims 1-4, 6-17, 22-25, 27-31, and 55-58 pending in this application, of which claims 1, 6, 11, and 22 are independent. Additionally, of the allowed claims 18-21, 32-38, 40 and 41, claims 18 and 32 are independent. Favorable reconsideration is respectfully requested in view of the following remarks.

### **Examiner Interview**

The applicant thanks Examiner Odom for his participation in the phone interview with the undersigned on April 7, 2008. In response to the applicant's assertions that the cited art does not teach calculating an entropy value and that a probability signal cannot be fairly construed as entropy, Examiner Odom conveyed his concern with the term "entropy" in the pending claims. In particular, Examiner

Odom suggested that incorporating the definition for entropy in the claims may be an acceptable amendment to advance the pending claims to allowance.

### **Rejections Under 35 U.S.C. §103**

Turning to the art rejections, the applicant respectfully submits that independent claim 1 is allowable over the art of record. Independent claim 1 is directed to an encoder that, *inter alia*, calculates an entropy value and encodes the signal to insert an ancillary code representing the calculated entropy value to preserve an entropy of the encoded portion of the signal. None of the cited references describes or suggests calculating an entropy value and encoding the signal to insert an ancillary code representing the calculated entropy value to preserve an entropy of the encoded portion of the signal, as recited in claim 1.

The official action appears to assert that Van Der Vleuten et al. describe calculating an entropy value (see official action, page 2, second paragraph, and page 4, item 3). In particular, the official action appears to equate the claimed term “entropy” with the term “probability” as described by Van Der Vleuten et al. The applicant respectfully submits that equating these terms is an inappropriate construction of the claim language. In fact, as set forth in detail below, equating the terms “entropy” and “probability” is inconsistent with the subject matter described by Van Der Vleuten et al.

While Van Der Vleuten et al. describe an entropy encoder (element 154), such entropy encoder fails to describe or suggest calculation, much less calculating an entropy value. *Van Der Vleuten et al.*, 14:56-63. Instead, Van Der Vleuten et al. describe that the entropy encoder (154) encodes a residual bitstream to enable data compression and determine the probability that one of the bits in the bitstream has a predetermined logical value. *Van Der Vleuten et al.*, 14:63-67. However, encoding a

signal in a way that determines whether a bit has a predetermined value is remarkably different than encoding a value in a signal where the value is representative of an entropy of the signal. In other words, an entropy encoder actually works to affect or change a characteristic (i.e., the entropy) of the signal it encodes, whereas the encoder recited in claim 1 inserts a code representing the entropy value of the signal while preserving (e.g., substantially not changing) the entropy of the signal. Furthermore, to the extent that Van Der Vleuten et al. describe any operation related to value determination, such activity is merely related to determining a probability value based on a prediction filter (element 10). *Van Der Vleuten et al.*, 15:14-17.

Extrinsic references also illustrate that entropy encoding does not constitute calculation of an entropy value, but instead is "...a coding scheme that involves assigning codes to symbols so as to match code lengths with the probabilities of the symbols. Typically, entropy encoders are used to compress data by replacing symbols represented by equal-length codes with symbols represented by codes proportional to the negative logarithm of the probability." *PlanetMath.org* (accessed April 7, 2008). The aforementioned extrinsic source, which is consistent with Van Der Vleuten et al., illustrates that an entropy encoder does not calculate an entropy value of a signal and, rather than preserving entropy, compresses data, which inherently alters signal characteristics (i.e., the signal entropy).

The applicant further submits that equating the terms "entropy" and "probability" is improper because Van Der Vleuten et al. describe that a data compression unit includes the entropy encoder 154 and a probability determining unit 156. The entropy encoder described by Van Der Vleuten et al. encodes a residual bitstream signal into a compressed data residual bitstream signal in response to probability values supplied to its input. To that end, Van Der Vleuten et al. separately

describe the entropy encoder and probability values, thereby precluding any argument that Van Der Vleuten et al. consider these terms to be equivalent. Any such association between these terms would render at least one of them superfluous.

To further illustrate that the term “entropy” is not fairly construed as “probability,” Van Der Vleuten et al. describe generating filter coefficients with a prediction unit, in which such coefficients are transmitted along with a compressed signal to a decoder. *Van Der Vleuten et al.*, 14: 47-55. The filter coefficients allow selection of a conversion table that includes predicted binary values that occur after an n-bit sequence being received. *Van Der Vleuten et al.*, 10: 8-25. For example, Van Der Vleuten et al. describe a conversion table having a detector to detect a bit value following a bit pattern and several counters that increment based on the detected bit value. *Van Der Vleuten et al.*, 10:25-53. The process of receiving a bit pattern, detecting the bits following that bit pattern, and increasing a counter in view of each followed bit pattern is repeated any number of times to predict a binary value or a binary sequence. *Van Der Vleuten et al.*, 10:54 through 11:14. Accordingly, Van Der Vleuten et al. describe that this process of determining the probability that a bit in the residual bitstream signal has a predetermined logical value is the function of the probability determining unit (*see Van Der Vleuten et al.*, 14:67 through 15:4), but Van Der Vleuten et al. are completely silent to calculating an entropy value.

The applicants also submit that the terms “entropy” and “probability” are not properly equated based on, in part, the requirement that claim terms must be given their broadest reasonable interpretation that is consistent with the specification and one that would be reached by those skilled in the relevant art. *In re Hyatt*, 211 F.3d 1367, 1372 and *In re Cortright*, 165 F.3d 1353, 1358 (Fed. Cir. 1999). In the instant

application, claim 1 recites an entropy value that, under a proper construction, means, in part, a measure of the energy of the signal.

In determining the meanings of claim terms, words whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say. *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004). In the instant application, the applicant respectfully submits that the term “entropy” is properly construed in view of the context in which it has been used. In fact, the term “entropy” is defined in several different ways, as evidenced by extrinsic references. If extrinsic references, such as dictionaries, evidence more than one definition for the term, the intrinsic record must be consulted to identify which of the different possible definitions is most consistent with applicant’s use of the terms. *MPEP* §2111.01(II).

One extrinsic reference defines entropy as “a measure of the loss of information in a transmitted signal or message.” *Dictionary.com Unabridged (v 1.1)*, Random House, Inc. (accessed April 4, 2008). The applicant respectfully submits that a person skilled in the relevant art reasonably interprets the term “entropy” based on the context in which that term is used, particularly in view of the differences presented by the aforementioned extrinsic reference that defines the term “entropy encoder” above. Additionally, a person skilled in the relevant art would, in view of the specification, identify that the definition of the term “entropy” as shown above is consistent with the applicant’s use of that term. As described earlier, the first extrinsic reference that defined “entropy encoder” is consistent with the subject matter described by Van Der Vleuten et al. and expressly addressed the use of entropy encoders for the purpose of compression, but such reference is completely devoid of calculating an entropy value, much like Van Der Vleuten et al. On the other hand, the

second extrinsic reference that defined “entropy” is consistent with the claimed subject matter of the instant application by referring to a measure of the loss of information, for which a person skilled in the relevant art would reasonably associate with calculating an entropy value.

Similarly, Jensen et al. also fail to describe or suggest calculating an entropy value. In fact, Jensen et al. is completely silent to entropy. Unlike calculating an entropy value, Jensen et al. evaluates the ability of an audio signal to mask a code frequency component by determining broadband energy content of the audio signal. *Jensen et al.*, 15:41-44. Jensen et al. then determines a permissible overall code power level to which each code component is assigned an amplitude adjustment factor to yield a component power level (*Id.*, at 15:55-62), but Jensen et al. is completely silent to an entropy value, much less calculating an entropy value.

As a result, because neither Van Der Vleuten et al. nor Jensen et al., describe calculating an entropy value, no combination of Van Der Vleuten et al. or Jensen et al. can render independent claim 1 obvious.

The official action also appears to assert that Van Der Vleuten et al. describe encoding the signal to insert an ancillary code representing the calculated entropy value (see official action, page 2, second paragraph, and page 4, item 3). In particular, the official action again equates the probability signal described by Van Der Vleuten et al. in column 24, lines 1-5 with the claimed entropy value, an association to which the applicant does not agree. Unlike encoding the signal to insert an ancillary code representing the calculated entropy value, Van Der Vleuten et al. apply a prediction unit and a probability unit to generate an output signal suitable for compression. *Van Der Vleuten et al.*, 14:56-67. Van Der Vleuten et al. identify that an output bitstream signal from a 1-bit analog to digital converter is noisy and

random, thereby making compression efforts difficult. *Id.*, at 3:22-25. Thus, Van Der Vleuten et al. employ the prediction unit to generate filter coefficients on an encoding side, which are transmitted along with the compressed signal to a decoder, but such filter coefficients are not an entropy value. *Id.*, at 8:28-32.

Jensen et al. also fail to describe or suggest encoding the signal to insert an ancillary code representing the calculated entropy value. As described above, because Jensen et al. are completely silent to entropy, much less calculating an entropy, Jensen et al. do not encode the signal to insert an ancillary code representing the calculated entropy value, as recited in claim 1. As a result, because neither Van Der Vleuten et al. nor Jensen et al., describe encoding the signal to insert an ancillary code representing the calculated entropy value, no combination of Van Der Vleuten et al. or Jensen et al. can render independent claim 1 obvious.

Even if Van Der Vleuten et al. describe calculating an entropy value or encoding the signal to insert an ancillary code representing the calculated entropy value, an assertion to which the applicant does not agree, Van Der Vleuten et al. teach away from the recited claims. Unlike encoding the signal to insert an ancillary code representing the calculated entropy value to preserve an entropy, Van Der Vleuten et al. explicitly aims to decrease the entropy of the signals. *Van Der Vleuten et al.*, 5:10-13. As discussed above, Van Der Vleuten et al. employ a prediction unit and a probability unit to generate an output signal suitable for compression. *Van Der Vleuten et al.*, 14:56-67.

Based on the foregoing deficiencies of Van Der Vleuten et al., Jensen et al., and because Van Der Vleuten et al. teach away from the claimed subject matter, it necessarily follows that Van Der Vleuten et al. and Jensen et al., alone or in combination, cannot render claim 1 obvious. Accordingly, the applicant respectfully

requests that the rejection of independent claim 1 be withdrawn for at least the foregoing reasons. Additionally, the rejection of claims 2-4, dependent upon independent claim 1, must also be withdrawn for the foregoing reasons.

Independent claims 6, 11, and 22 are also patentable over the art of record for at least the reasons set forth above in connection with claim 1. Thus, the applicant respectfully submits that these claims, and all claims dependent thereon, are also in condition for allowance. Reconsideration is respectfully requested.

Thus, for at least the foregoing reasons, the applicant respectfully submits that all pending claims are now in condition for allowance. If there are any remaining issues in this application, the applicants urge the examiner to contact the undersigned attorney at the number listed below.



The Commissioner is authorized to charge any deficiency in the enclosed check toward payment of any fee due for the filing of this paper to deposit account number 50-2455.

Respectfully submitted,

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